

Application Serial No. 09/381,143
Reply to Office Action of July 14, 2004

PATENT
Docket: CIJ-2003

Amendments To The Claims

The listing of claims presented below will replace all prior versions, and listings, of claims in the application.

Listing of claims:

1. (currently amended) A communications device which is arranged to process messages for communications, comprising a virtual machine means which includes

a virtual function processor and function processor instructions for controlling operation of the device, and

message instruction means including a set of descriptions of message data;

a virtual message processor, which is arranged to be called by the function processor and which is arranged to carry out the message handling tasks of assembling the messages, disassembling messages and comparing the messages under the direction of the message instruction means that is arranged to provide directions for operation of the virtual message processor, whereby when a message is required to be handled by the communications device the message processor is called to carry out the message handling task,

wherein the virtual machine means is emulatable in different computers having incompatible hardwares or operating systems.

2. (original) A device in accordance with claim 1, further comprising a virtual protocol processor arranged to organize communications

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to and from the device, and

protocol processor instruction means arranged to provide directions
for operation of the protocol processor means.

3. (previously presented) A device in accordance with claim 1, wherein the device includes a microprocessor which runs in accordance with native software code, and the message processor is implemented as the native software code of the microprocessor.

4. (original) A device in accordance with claim 2, wherein the device includes a microprocessor which runs in accordance with native software code and the protocol processor is implemented as a native software code of the microprocessor.

5. (previously presented) A device in accordance with claim 3, wherein the function processor is implemented as native code of the microprocessor.

6. (cancelled)

7. (previously presented) A device in accordance with claim 1, wherein the message processor instruction means is implemented in software defined by the message processor, wherein the device includes a microprocessor, and wherein the message instruction means do not require translation to the native software code of the microprocessor.

8. (previously presented) A device in accordance with claim 2, wherein the device includes a microprocessor which runs in accordance with native software code and wherein the protocol instruction means are implemented in software defined by the protocol processor means, and do not require translation to the

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native code of the microprocessor.

9. (previously presented) A device in accordance with claim 1, wherein the device includes a microprocessor which runs in accordance with native software code, and wherein the function processor instruction means are implemented in software defined by the function processor means and do not require translation to the native code of the microprocessor.

10. (previously presented) A device in accordance with claim 1, including a hardware abstraction layer comprising a series of routines which provide an application program interface to exercise an operating system, BIOS or hardware drivers of the device.

11. (previously presented) A device in accordance with claim 1, where n the device is a specialized network access device arranged for communicating over a network.

12. (previously presented) A device in accordance with claim 11, the device being a remote payment terminal and the messages being messages relating to remote payment transactions.

13-15. (canceled)

16. (previously presented) A method of programming a device for processing communications, comprising the steps of loading a processing means of the device with a virtual machine which includes a virtual function processor and function processor instructions for controlling operation of the device, and a virtual message processor which is arranged to be called by the function processor and which is arranged to carry out the task of assembling,

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disassembling and comparing messages, whereby when a message is required to be handled by the communications device the message processor is called to carry out the message handling task, wherein the virtual machine means is emulatable in different computers having incompatible hardwares or operating systems.

17. (previously presented) A method in accordance with claim 16, comprising the further step of loading the processor means of the device with a virtual protocol processor arranged to organize communications to and from the device, and protocol processor instructions arranged to provide directions for operation of the protocol processor.

18. (previously presented) A computer memory storing instructions for controlling a computing device to implement a virtual machine means which includes a virtual function processor and function processor instructions for controlling operation of the device, and a virtual message processor which is arranged to be called by the function processor and which is arranged to carry out the task of assembling, disassembling and comparing messages, whereby when a message is required to be handled by the communications device the message processor is called to carry out the message handling task, wherein the virtual machine means is emulatable in different computers having incompatible hardwares or operating systems.

19. (original) A computer readable memory in accordance with claim 18, further storing instructions for implementing message processor instruction means arranged to provide directions for operation of the message processor.

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20. (previously presented) A computer readable memory in accordance with claim 18, further storing instructions for implementing a virtual protocol processor arranged to organize communications to and from the computing device.

21. (original) A computer readable memory in accordance with claim 20, further storing instructions for implementing protocol processor instructions arranged to provide directions for operation of the protocol processor means.

22-23. (canceled)